CLAIMS

What is claimed is:

1. A composition for enhancing the introduction efficiency of a target substance into a cell, comprising a cellular adhesion related agent.

2. A composition for enhancing the introduction efficiency of a target substance into a cell according to claim 1 wherein the cellular adhesion related agent comprises an interaction substance interacting with a cellular adhesion molecule.

3. A composition according to claim 2, wherein the cellular adhesion molecule is an extracellular matrix.

4. A composition according to claim 2, wherein the cellular adhesion molecule is an integrin receptor.

5. A composition according to claim 2, wherein the cellular adhesion molecule comprises an RGD molecule.

6. A composition according to claim 2, wherein the interaction molecule raises an antigen-antibody reaction with a partner of the cellular adhesion molecule.

7. A composition according to claim 2, wherein the interaction molecule is an antibody or a derivative thereof.

8. A composition according to claim 2, wherein the interaction molecule is a monoclonal or polyclonal antibody.

9. A composition according to claim 2, wherein the interaction molecule comprises an antibody selected from the group consisting of an anti-CD49a antibody, an anti-CD49b antibody, an anti-CD49c antibody, an anti-CD49e antibody, and an anti-CD49f antibody.

10. A composition according to claim 1, wherein the target substance comprises a genetic material.

11. A composition according to claim 1, wherein the target substance comprises a nucleic acid molecule.

12. A composition according to claim 1, wherein the target substance comprises DNA.

13. A composition according to claim 4, wherein the integerin receptor is selected from the group consisting of CD49a, CD49b, CD49c, CD49d, CD49e, CD49f and CD29.

14. A composition according to claim 4, wherein the integrin receptor is selected from the group consisting of CD29, CD49a, CD49c, Cd49d, CD49e and CD49f.

15. A composition according to claim 4, wherein the intergrin receptor interacts with a molecule selected from the group consisting of collagen, fibronectin, vitronectin and laminin.

16. A composition according to claim 1, wherein the cell comprises at least one cell selected from the group consisting of a stem cell and a differentiated cell.

17. A composition according to claim 1, wherein the cellular adhesion molecule is specifically expressed in the cell.

18. A composition according to claim 1, wherein the target substance is a genetic material and the composition further comprises a gene introduction reagent.

19. A composition according to claim 18, wherein the gene introduction reagent is selected from the group consisting of a cationic macromolecule, cationic lipid and calcium phosphate.

20. A composition according to claim 1, further comprising a particle.

21. A composition according to claim 20, wherein the particle comprises a gold colloid.

22. A composition according to claim 1 further comprising a salt.

23. A composition according to claim 22, wherein the salt is selected from the group consisting of salts comprised in a buffer and salts comprised in media.

24. A kit for enhancing gene introduction efficiency, comprising:

(a) a cellular adhesion related agent; and

(b) a gene introduction reagent.

25. A composition for introducing a target material to a cell, comprising:

(A) a target material; and
(B) a cellular adhesion related agent.

26. A composition according to claim 25, wherein the target material comprises a substance selected from the group consisting of DNA, RNA, polypeptide, sugar and a complex thereof.

27. A composition according to claim 25, wherein the target material comprises a DNA encoding a gene sequence to be transfected into the cell.

28. A composition according to claim 25 further comprising a gene introduction reagent.

29. A composition according to claim 25, wherein the cellular adhesion related agent comprises an interaction substance interacting with a cellular adhesion molecule.

30. A composition according to claim 25, wherein the cellular adhesion related agent comprises an antibody to a cellular adhesion molecule.

31. A composition according to claim 25 which is present as a liquid phase.

32. A composition according to claim 25 which is present as a solid phase.

33. A device for enhancing gene introduction efficiency of a target molecule into a cell, comprising:
(a) a target molecule; and
(b) a cellular adhesion related agent,

wherein the cellular adhesion related agent is immobilized onto a support.

34. A device according to claim 33, wherein the target substance comprises a substance selected from the group consisting of DNA, RNA, polypeptide, sugar and a complex thereof.

35. A device according to claim 33, wherein the target substance comprises a DNA encoding a gene sequence for the purpose of gene expression.

36. A device according to claim 33, further comprising a gene introduction reagent.

37. A device according to claim 36, wherein the cellular adhesion related agent comprises an interaction substance interacting with a cellular adhesion molecule.

38. A device according to claim 36, wherein the cellular adhesion related agent comprises an antibody against a cellular adhesion molecule.

39. A device according to claim 36, wherein the support is selected from the group consisting of a plate, a microwell plate, a tip, a slide glass, a film, a bead and metal.

40. A device according to claim 36, wherein the support is coated with a coating agent.

41. A device according to claim 40, wherein the coating agent comprises a substance selected from the group consisting of poly-L-lysine, silane, MAS, hydrophobic

fluorine resin and metal.

42. A method for enhancing the introduction efficiency of a target substance into a cell, comprising the steps of:

A) providing a target substance;

B) providing a cellular adhesion related agent; and

C) contacting the target substance and the cellular adhesion related substance with the cell.

43. A method according to claim 42, wherein the target material comprises a substance selected from the group consisting of DNA, RNA, polypeptide, sugar and a complex thereof.

44. A method according to claim 43, wherein the target material comprises a DNA encoding a gene sequence to be transfected in the cell.

45. A method according to claim 42, further comprising a gene introduction reagent.

46. A method according to claim 42, wherein the cellular adhesion related agent comprises an interaction substance interacting with a cellular adhesion molecule.

47. A method according to claim 42, wherein the cellular adhesion related agent comprises an antibody to a cellular adhesion molecule.

48. A method according to claim 46, wherein the cellular adhesion molecule is an extracellular matrix molecule.

49. A method according to claim 42, wherein the method is

conducted in a liquid phase.

50. A method according to claim 42, wherein the method is conducted in a solid phase.

51. A method for enhancing the introduction efficiency of a target substance into a cell, comprising the steps of:

I) immobilizing a composition comprising

A) a target substance, and

B)a cellular adhesion molecule

onto a support; and

II) contacting a cell to the composition on the support.

52. A method according to claim 51, further comprising the step of providing a gene introduction reagent, said gene introduction reagent being contacted with the cell.

53. A method according to claim 52, further comprising the step of forming a complex between the target substance and a gene introduction reagent after the provision thereof, wherein thereafter the cellular adhesion related agent is provided.

54. A method according to claim 51, wherein the cellular adhesion related agent comprises an interaction substance interacting with a cellular adhesion molecule.